

## GHGSat: Identifying super-emitters from space

### Challenge:

A significant proportion of methane emissions comes from fossil fuel operations, but identifying specific sources is challenging. Studies show that a small number of high emitting leaks are responsible for the bulk of emissions, yet finding them is often expensive, logistically challenging, labour intensive, and inaccurate. Current methods to monitor oil sand mining, for example, have a degree of uncertainty of 50% or more. To effectively deal with emissions, we need to know where they are.

### Solution:

GHGSat has developed a satellite specifically designed to look for and monitor facility-level emissions. Launching the first demonstration satellite in 2016 and a second, commercial satellite in 2020, it uses a Fabry-Perot imaging spectrometer to measure methane concentrations at any point on earth every other day. These periodic surveys identify super-emitters at a low cost without the need for on-site equipment.

Aggregating data from its own and third-party satellites and other sources, GHGSat offers a range of commercial services including high-resolution imagery from space and aircraft, leak risk assessment, hotspot detection, and predictive analysis. To raise awareness of methane with the broader public, the company released a free online tool that shows monthly averaged methane concentrations in the atmosphere on a grid 2km x 2km over land worldwide.

### Result:

The technology is delivering actionable information to emitters from a space-based spectrometer. One emission source detected in central Asia led to the operator being identified and informed via diplomatic channels, and the leak fixed. This single intervention was the equivalent of taking one million cars off the road per year.

### Expanding impact:

GHGSat aims to launch its third satellite in January 2021, and a further 8 by end of 2022. Improved data availability will help super-emitters mitigate their emissions and provide global policy makers with a better understanding of the problem.



**GHGSat provides accurate, low-cost greenhouse gas monitoring data and services covering any facility in the world.**

### At a glance

- Year founded: 2011
- Year joined OGCI Climate Investments: 2018
- Leadership: Stephane Germain, President
- Website: <https://www.ghgsat.com/>



## GHGSat: Global methane detection at facility level

### Challenge:

Methane is a potent, but odourless and colourless greenhouse gas, a combination that makes detecting leaks both very important and very hard. Over a 20 year period, it has over 80 times more global warming potential than carbon dioxide, yet humans are releasing hundreds of millions of tonnes of it every year.

### Solution:

In the last few years, methane detection technology has advanced significantly, making it easier to identify sources of leaks and reduce emissions. Satellites launched by GHGSat and currently orbiting the earth are able to monitor emissions at facility level, giving companies close to real time data about their global operations.

### Result:

In February 2021, a new high-resolution GHGSat satellite captured images of a 52 square kilometre area of central Turkmenistan where eight leaks were emitting around 10 tonnes of methane an hour - an hourly warming equivalent of driving 250,000 cars. Analysis of the image revealed that half of the emissions from the gas field were likely to be coming from leaky valves on natural gas pipelines, and the other half from flares.

When GHGSat found and reported a similar Central Asian leak in 2019, the resulting fix was equivalent to taking one million cars off the road a year.

### Expanding impact:

GHGSat launched its first high-resolution commercial satellite in September 2020, and its second less than 5 months later. Both satellites are equipped with a state-of-the-art sensor that detects methane emissions from sources 100 times smaller than some satellites, and can attribute emissions sources with 100 times higher precision than other commercial or state-funded satellites.

Through 2022 the company is planning to add a further nine satellites to its constellation.



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